FAC 1648

DRAFT

① leave out wet on cyclone descriptions
② NSPS <1% VOC by content not g/litres
③ Need electronic copy to pt @ library
④ Testing needs changes

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
SPECIFIC CONDITIONS

Post-it® Fax Note 7671	Date	# of pages ▶ 4-1
To David Schutz	From Dave Clark	
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Permit Number 2000-128-C (PSD)

/ with the specifications submitted to Air ion received August 16, September 18, a Memorandum, dated October 13, 2000, explains the derivation of applicable permit requirements and estimates of emissions; however, it does not contain operating limitations or permit requirements. Commencing construction or operations under this permit constitutes acceptance of, and consent to, the conditions contained herein:

1. Points of emissions and emissions limitations for each point: [OAC 252:100-8-6(a)]

A. EUG "MIX": Existing Rubber Mixing Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
MIX-1	PE-201	Mix Area Vacuum Cleaner	1.2	5.2	10.4	45.8
MIX-5	PE-209 PE-213 PE-202	Mix Line 11				
MIX-6	PE-210 PE-211 PE-214 PE-205	Mix Line 14				

i. The following operations shall utilize specified PM emissions controls or equivalent devices with at least the required control efficiency.

Operation	PM Emission Control Device	Minimum Required Efficiency
Mixing Line 11	baghouse	~~98.5%~~ 98%
Mixing area vacuum cleaner	cartridge ~~baghouse~~	98%
Mixing Line 14 pigment	baghouse	98%
Mixing Line 14 carbon black	baghouse	~~98%~~ 98.5%
~~Mixing Line 14 pigment~~	~~baghouse~~	~~98%~~

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D. EUG "CUR": Existing Tire Curing Operations

EU ID#	Point ID#	EU Name	VOC	
			lb/hr	TPY
CUR-1	EF *	Curing presses	31.7	138.9

E. EUG "MEMB": Existing Membrane Production Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
MEMB-1	~~PE-270~~ 253 PE-270 PE-269	Bladder line	0.2	0.7	0.4	1.4

i. All grinding shall be vented to ~~wet~~ cyclones or equivalent devices with PM control efficiencies of at least 90%.

F. EUG "PUNCT": Puncture Sealant Mixing & Application (both discharge to common stack)

EU ID#	Point ID#	EU Name	VOC	
			lb/hr	TPY
PUNCT-1	~~PE-281~~ PE-235	Puncture seal mixer No. 1	0.14	0.6
PUNCT-2	PE-235	Puncture seal mixer No. 2		

G. EUG "GTS": Existing Green Tire Spraying Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
GTS-3	PE-247 248	Green tire sprayer No. 105	2.5	11.1	0.5	2.0
GTS-4	PE-249	Green tire sprayer No. 106				

i. All spraying shall be vented to baffle chambers or equivalent devices with PM control efficiencies of at least 50%.

ii. VOC emissions from the green tire spraying units shall not exceed 1.2 grams per tire for inside carcass sprays. [40 CFR 60.542(a)(5)(I)]

iii. VOC emissions from the green tire spraying units shall not exceed 9.3 grams per tire for outside-carcass sprays. [40 CFR 60.542(a)(5)(ii)]

P. EUG "TANKS-1": Tanks Subject to NSPS Subpart Kb

EU	Point	EU Description	Capacity	VOC	
				lb/hr	TPY
B	Tank B-1	North process oil tank	30,000 gal.	0.4	1.8
B	Tank B-2	Middle process oil tank	30,000 gal.		
B	~~Tank B-3~~	~~South process oil tank~~	~~17,000 gal.~~		

capacity below NSPS

i. The permittee shall keep records of the dimensions and capacity of all of the above tanks [40 CFR 60.116b(b)]

ii. The permittee shall keep records of the true vapor pressure of liquids stored in tanks B-2 and B-3 [40 CFR 60.116b(c)]

Q. EUG "MIX-2": New Rubber Mixing Operations

EUG ID	Point ID	Process Description	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
MIX2-16	PE-283 PE-284	Mixing Line 13 Silica Silo	1.2	5.0	10.1	44.1
MIX2-18	PE-285 PE-~~285~~ 286 PE-287	Mixing Line 15				
MIX2-19	PE-288 PE-289 PE-290 PE-291	Mixing Line 16				

R. EUG "TBLDG-3": No. 4 Sidewall Line

EU ID#	Point ID#	EU Name	VOC	
			lb/hr	TPY
TBLDG-23	EF	Sidewall Line No. 4	0.5	2.1

S. EUG "CUR-2": New Tire Curing Operations

EU ID#	Point ID#	EU Name	VOC	
			lb/hr	TPY
~~CUR-2~~ CUR2-2	EF	New curing presses	14.7	64.5

T. EUG "GTS-2": New Green Tire Spraying Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
GTS2-6	PE-246	GTS Sprayer	0.1	0.5	0.4	1.8
GTS2-7	PE-247	GTS Sprayer				
GTS2-8	PE-248	GTS Sprayer				

i. All spraying shall be vented to cartridge filters or equivalent devices with PM control efficiencies of at least 99%.

ii. VOC emissions from the green tire spraying units shall not exceed 1.2 grams per tire for inside carcass sprays. [40 CFR 60.542(a)(5)(i)]

iii. VOC emissions from the green tire spraying units shall not exceed 9.3 grams per tire for outside-carcass sprays. [40 CFR 60.542(a)(5)(ii)]

U. EUG "TUO-NEW": New Tire Uniformity Grinding Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
TUO-9	PE-292	New TUO grinder	0.11	0.5	0.21	0.9
TUO-10	PE-293	New TUO grinder				
TUO-11	PE-294	New TUO grinder				
TUO-12	PE-295	New TUO grinder				
TUO-13	PE-296	New TUO grinder				
TUO-14	PE-297	New TUO grinder				

i. All tire grinding shall be vented to ~~wet~~ cyclones or equivalent devices with PM control efficiencies of at least 90% and which achieve PM concentrations at discharge of 0.5 gr/dscf or less.

V. EUG "MIX-3": Rubber Mixing Operations

EU ID#	Point ID#	EU Name	PM_{10}		VOC	
			lb/hr	TPY	lb/hr	TPY
MIX3-2	PE-206 PE-212 PE-203	Mixing Line 12	1.2	5.2	14.3	62.7
MIX3-3	PE-207 PE-208 PE-215 PE-~~214~~ → 204	Mixing Line 13				

i. All solids handling operations shall be vented to baghouses or equivalent devices with PM control efficiencies of at least 99%.

ii. VOC discharges from PE-206, PE-207, PE-203, PE-212, PE-208, PE-~~214~~ 204, and PE-215 shall not exceed 20 ppm, 24-hour average, expressed as ethanol, on a flow-weighted average basis.

W. Plant-Wide Total Emissions Limitations

Pollutant	Emissions Limitations, TPY
PM_{10}	29.1
SO_2	22.9
NOx	63.6
VOC	627.2
CO	33.8

2. The permittee shall be authorized to operate the facility 24 hours per day, every day of the year, up to the following raw material usage rates: [OAC 252:100-8-6(a)]

Raw Material	Usage Limitations		VOC Content	Solids Content
	Monthly	Annually		
Royal Seal	493,000 lbs	5,916,000 lbs	0.042%	--
Rubber solvent (lacolene)	46,928 lbs	563,137 lbs	100%	--
Green tire carcass spray compound concentrate	33,356 lbs	400,267 lbs	1.20%	51.6%
Anti-blem spray compound	51,109 lbs	613,303 lbs	---	28.5%
Bladder spray compound	7,893 lbs	94,718 lbs	1.2%	--
Inks	1,376 lbs	16,515 lbs	100%	--
Isopropanol solvent	3,664 lbs	43,968 lbs	100%	--
Other ink solvents	128 lbs	1,562 lbs	100%	--
Maintenance solvent	374 lbs	4,492 lbs	100%	--
Cured tire protectant spray	3,267 lbs	39,198 lbs	5.6%	1.1%
Rubber	44,391,909 lbs	532,702,910 lbs	--	--
Silane Compding	52,650 lbs	631,800 lbs	--	--
Silane Curing	66 tons	790 tons		

3. Tire production shall not exceed 60,000 tires per day. [OAC 252:100-8-6(a)]

4. The permittee shall calculate total emissions (tons per year) of each pollutant emitted to the atmosphere from the tire and bladder manufacturing operations. Emissions of volatile organic compounds shall be calculated from usage and amounts recovered from each process of each solvent-laden material, materials including cements, adhesives, paints, thinners, and cleaning solvents. [OAC 252:100-45]

5. Total liquid fuel usage in the three boilers shall not exceed 1,029,377 gallons per year. No more than two boilers shall be operated at a time except in "hot standby" mode. [OAC 252:100-8-6(a)]

on fuel oil.

7. The following records shall be maintained on-site to verify insignificant activities.
[OAC 252:100-43]

a. Hours of operation of the emergency generator (cumulative annual)

b. Throughput of fuel dispensing to vehicles (~~monthly~~ annual) Very small usage rate, will keep annual purchase records if okay

c. Kerosene, lacolene, and diesel storage tanks: vapor pressures of liquids stored ('gas & diesel?')

d. Parts washers: usage of organic solvents (12-month rolling totals)

e. Throughput of solvents in tanks A-1 and A-2 (monthly and 12-month rolling totals)

8. Upon commencement of construction, this permit will supersede all previous Air Quality permits for this facility which will become null and void.

9. The permittee shall conduct post-construction ambient air monitoring of ozone and PM_{10}. A minimum of one year PM_{10} monitoring shall be conducted. A minimum of six months ozone monitoring shall be conducted, commencing no later than April 15 of the year following commencement of operations and concluding no sooner than the following October 15.
[OAC 252:100-8-35(d)(5)]

10. Within 60 days of achieving maximum output from the new and modified equipment, not to exceed 180 days from initial start-up, and at other such times as directed by AQD, the permittee shall conduct performance testing of the new and modified emission units listed in Item "a" and "b" furnish a written report to AQ documenting compliance with emissions limitations. The testing is required to confirm compliance with the emission limitations of Specific Condition No. 1.
[OAC 252:100-45]

a. Performance testing by the permittee shall use the following test methods specified in 40 CFR 60.

Method 1: Sample and Velocity Traverses for Stationary Sources.

Method 2: Determination of Stack Gas Velocity and Volumetric Flow Rate.

Method 3: Gas Analysis for Carbon Dioxide, Excess Air, and Dry Molecular Weight.

Method 4: Determination of Moisture in Stack Gases.

Method 5: Determination of Particulate Matter Emissions from Stationary Sources.

Method 7E: Determination of NOx Emissions from Stationary Sources

Method 9: Visual Determination of Opacity

Method 25A: Determination of VOC Emissions from Stationary Sources

SECTION V. EMISSIONS

Air pollutants will be emitted from gluing/cementing operations, from solid raw materials mixing and handling, from rubber heating/molding operations, from green tire spraying, miscellaneous operations, and the three boilers. Emissions from adhesive usage, green tire spraying, protective coating, and puncture seal ("Royal Seal") are determined on a mass-balance basis. Emissions of powdered solids were determined from stack testing at other Uniroyal facilities. Estimated emissions for the tanks are based on TANKS3.1. Emissions from tire and bladder grinding were estimated from factors supplied by the Rubber Manufacturer's Association (RMA), as were emissions from compounding and extruding conventional tire rubber. Emissions from compounding and extruding silica rubber were based on stack testing by the RMA: compounding operations yield 0.122 pound of ethanol per pound of silane, while curing operations yield 0.049 pounds of ethanol per pound of silane. → both of which together account for 100% of theoretical ethanol available.

Emissions calculations were based on 60,000 tires per day. The sum of emissions shown for individual emissions units will exceed the plantwide total, allowing production to swing between EUGs, but the plantwide "cap" will provide the effective limitation.

PSD requires "netting", or a determination of the net change in emissions of all projects conducted within a contemporaneous time frame. The application has stated that there were no projects which reduced emissions. All net emissions changes were increases.

The Rubber Manufacturer's Association (RMA) has developed factors for VOC and toxic/HAP emissions from rubber processing; these factors have been proposed, but not yet accepted, for inclusion into AP-42. According to the applicant, whenever a range was specified, the high end of the range was used in calculating VOC emissions.

Post-Project Total Potential Emissions

EUG ID	PM_{10}		SO_2		NOx		VOC		CO	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
EUG MIX	1.2	5.2	--	--	--	--	10.4	45.8	--	--

EUG ID	PM_{10}		SO_2		NOx		VOC		CO	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
EUG TBLDG	--	--	--	--	--	--	59.7	261.6	--	--

EUG ID	PM_{10}		SO_2		NOx		VOC		CO	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
EUG TRED3	--	--	--	--	--	--	21.1	92.5	--	--

VOC emissions controls fall into two categories: process changes and discharge controls. The former category relies on reducing VOC content in raw materials and the most efficient usage of those raw materials. Outlet VOC control is accomplished by recovery or by combustion. Recovery methods include condensation and adsorption. Combustion may be conducted in a unit designed only to provide combustion (incinerator, etc.), in process equipment (e.g., a boiler), or utilizing microorganisms to achieve the oxidation. Although biofiltration is technically feasible, it is not a proven technology for this type of process.

The BACT analysis is heavily dependent on predicted stack flows. High ventilation rates are often required by fire prevention codes and/or occupational safety regulations. The size of control equipment and the operating costs of that equipment are proportional to the air flow to be processed. There is also a technological limitation of being able to control a VOC stream to no lower than 20 ppm VOC. (The 20 ppm threshold is incorporated into regulations such as 40 CFR Part 63 Subpart CC for petroleum refineries; since the MACT is theoretically more stringent than BACT, the assertion of a 20 ppm feasibility threshold is acceptable). The higher an air flow is, the more dilute the VOC concentration is, and the more difficult it is to reach 20 ppm. An EPA reference was cited for the BACT analysis, "Survey of Control Technologies for Organic Vapor Gas Streams" (EPA-456, May, 1995).

There are six operations subject to BACT for VOC: rubbers mills 15 & 16, rubber mills 12 and 13 (mixing the new silica rubber), Sidewall line No. 4, the new curing presses, replacement green tire sprayers, and the new TUO grinders.

The application ranked the following emissions control technologies:

- Recuperative thermal oxidizer
- Regenerative thermal oxidizer
- Regenerative catalytic oxidizer
- absorption
- condensation
- raw material changes

1. Rubber ~~Mills~~ Mixers 12 and 13 ~~mixers~~

The rubber ~~mills~~ processing silica rubber are predicted to have the highest VOC emissions. Based on stack flow estimates and VOC emissions limitations, VOC discharge concentrations are calculated at 51 ppm. This is just above the technical feasibility level for VOC control (20 ppm) using oxidative systems.

below 20 ppm

Several of the above control technologies were rejected for technological reasons. Alternative raw materials are not practical. Condensation also is not practical given the high exhaust volume and low temperature needed to achieve any significant reduction. (One potential condensation method would be wet scrubbing; although ethanol is water-soluble, the remaining VOCs emitted have low solubilities in water.) The EPA reference cited states, "Adsorbers generally do not function well with streams below 20 ppm and are not recommended for streams with flow rates greater than 50,000 scfm." The flow here, 107,000 acfm, is well above the recommended threshold. Solid adsorption media are susceptible to plugging by the PM given off by the process. With a flow of 107,000 ACFM at 70°F, a VOC emission rate of 14.3 lb/hr from the lines blending the silane rubber, and using a molecular weight of 46 (ethanol), the anticipated maximum VOC concentration is 18.6 ppm. This concentration is below the 20 ppm threshold for VOC control devices. Since the silane rubber mixing has the highest concentration (having ethanol emissions not present at the other lines), all other equipment will have lower discharge VOC concentrations.

Of the oxidative controls, regenerative thermal oxidizers (RTOs) provide the most efficient VOC control with the lowest operating costs. The EPA publications, "Control Technologies for Hazardous Air Pollutants" (EPA-625/6-91-014) "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams" (EPA-456), both recommend RTOs for streams wtih 50 ppm or more organic vapors. The former publication is geared to MACT determinations which are more stringent than BACT determinations. The latter publication also addresses concentrator-type systems, where VOC is adsorbed from the stream then stripped to a lower-volume stream with higher concentrations prior to destruction. These systems are not recommended for VOC concentrations below 20 ppm and air flows above 50,000 ppm. The conditions expected for the rubber compounding (18.6 ppm and 107,000 ACFM) are outside the conditions where EPA recommends these air pollution controls.

BACT for these units is acceptable as no add-on controls. The permit will require stack testing to verify the flow rates upon which the analysis was based, and ambient ozone monitoring will be required to ensure the facility remains an attainment area.

VOC emissions are a function of both rubber processing and silane usage. The permit will limit total silane usage, and rubber usage will be part of a plant-wide limitation.

2. Rubber Mixers 15 and 16

Rubber mixers 15 and 16 will mix conventional rubber mixes. Therefore, VOC emission rates will be well below the preceding mills, and VOC concentrations will be below the 20 ppm threshold at which add-on controls are feasible. There is no feasible raw material substitution.

BACT is acceptable as no add-on controls for this operation. Emissions will be limited by an overall plant-wide limit on rubber processing.

The following Oklahoma Air Pollution Control Rules are not applicable to this facility:

OAC 252:100-11	Alternative Emissions Reduction	not requested
OAC 252:100-15	Mobile Sources	not in source category
OAC 252:100-17	Incinerators	not type of emission unit
OAC 252:100-23	Cotton Gins	not type of emission unit
OAC 252:100-24	Grain Elevators	not in source category
OAC 252:100-39	Nonattainment Areas	not in area category
OAC 252:100-47	Landfills	not in source category

SECTION XI. FEDERAL REGULATIONS

PSD, 40 CFR Part 52 [Applicable]

Total potential emissions for PM_{10} and VOCs are greater than the levels of significance. This permit incorporates the requirements of PSD: a BACT analysis, an analysis showing compliance with NAAQS for pollutants with emissions increases above PSD significance levels, an analysis showing compliance with increment consumption, an analysis of effects on population growth, soils, vegetation, visibility, and Class I area impacts.

NSPS, 40 CFR Part 60 [Subpart BBB Applicable]

Subpart D and Da (Steam Generating Units) affect boilers with rated heat input capacities of 250 MMBTUH or more. Each boiler has a capacity of 60 MMBTUH, which is smaller than the de minimis level for these regulations.

Subpart Db (Steam Generating Units) affects boilers with a rated heat input above 100 MMBTUH. Again, the 60 MMBTUH boilers are smaller than the applicability level.

Subpart Dc (Steam Generating Units) affects boilers with a rated heat input between 10 and 100 MMBTUH with commenced construction, reconstruction, or modification after June 19, 1989. All boilers were constructed prior to this date.

Subpart K, Ka, Kb (VOL Storage Vessels). None of the tanks are subject to any of the subparts because they were either installed prior to an applicable date or are too small.

Subpart VV (Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry). The equipment is not in a SOCMI plant.

Subpart BBB (Rubber Tire Manufacturing) affects equipment that commence construction, modification, or reconstruction after January 20, 1983: each undertread cementing operation, each sidewall cementing operation, each tread end cementing operation, each bead cementing operation, each green tire spraying operation, and various Michelin-specific operations. Tire curing presses are not an affected operation. The tread end cementing operation permitted under Permit No. 96-139-C is limited to 10 grams per tire of VOC emissions, while the green tire spraying units installed under Permit Nos. 91-035-C and 96-139-C (M-1) are limited to 1.2 grams per tire of VOCs. The Michelin "B" operation will be required either to achieve a 75% control of VOC emissions, or emit no more than 124 lb/day (monthly average).

<1% VOC
not 1.2 g/tire